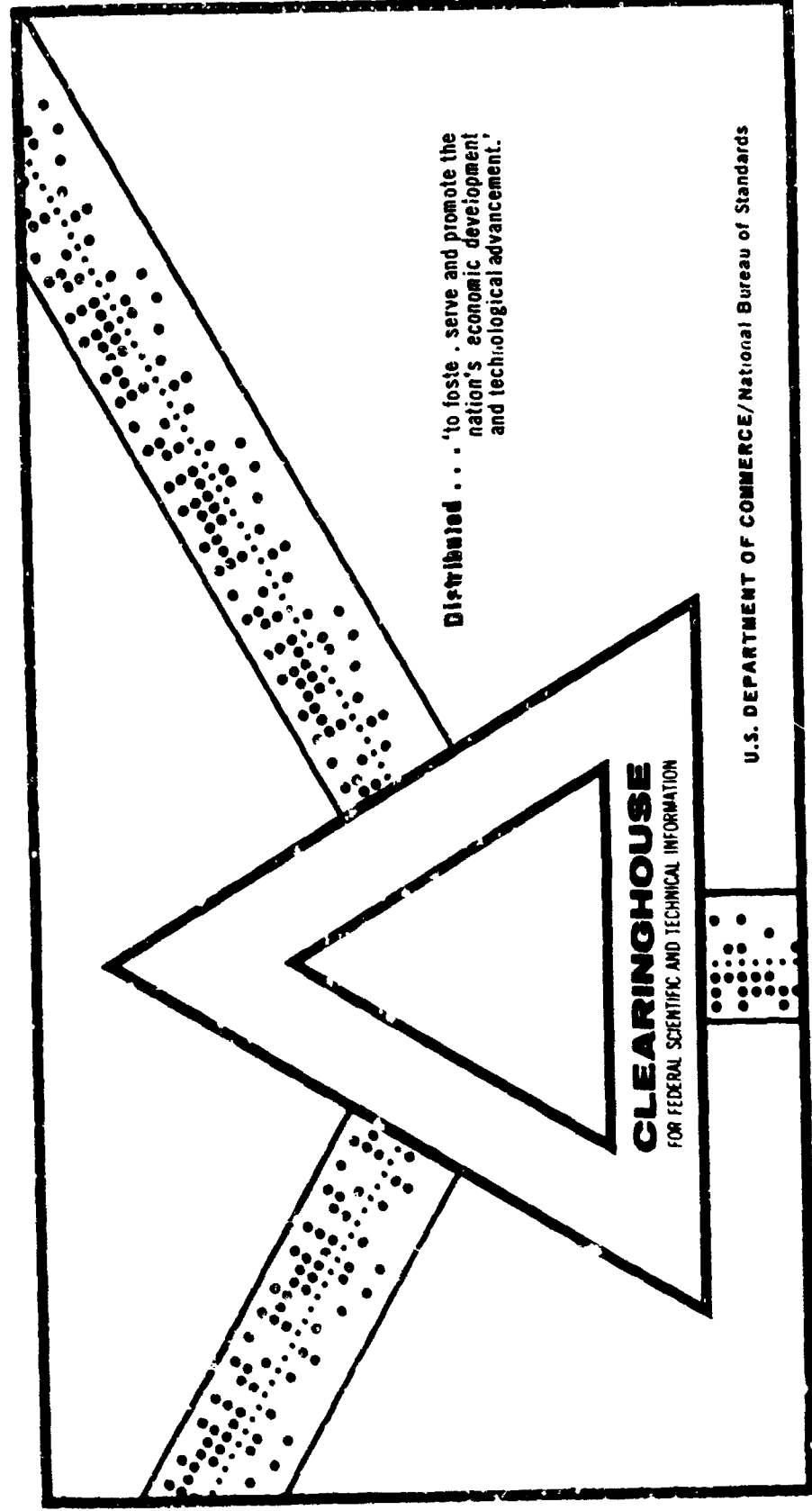


# CONDITIONED ATTRACTION, SIMILARITY, AND EVALUATIVE MEANING

Richard B. Stalling

Hawaii University  
Honolulu, Hawaii

August 1969



This document has been approved for public release and sale.

AD 696551



OFFICE OF NAVAL RESEARCH GRANT N00014-67-A-0387-0007

**LANGUAGE, PERSONALITY, SOCIAL, AND CROSS CULTURAL STUDY  
AND MEASUREMENT OF THE HUMAN A-R-D (MOTIVATIONAL) SYSTEM**

**DEPARTMENT OF PSYCHOLOGY  
UNIVERSITY OF HAWAII**

**HONOLULU, HAWAII 96822**

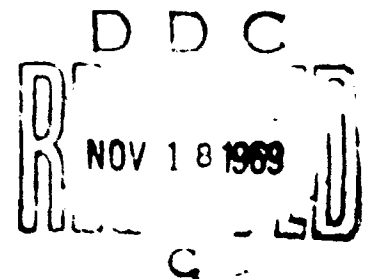
**Conditioned Attraction, Similarity, and Evaluative Meaning**

**Richard B. Stalling**

**Technical Report Number 1**

**August 1969**

**PRINCIPAL INVESTIGATOR:  
ARTHUR W. STAATS**



This document has been approved for public release and sale; its distribution is unlimited. Reproduction in whole or in part is permitted for any purpose of the United States Government.

Reproduced by the  
**CLEARINGHOUSE**  
for Federal Scientific & Technical  
Information Springfield, Va. 22151

Conditioned Attraction, Similarity and Evaluative Meaning<sup>1</sup>

Richard B. Stalling<sup>2</sup>

University of Hawaii-

Technical Report Number 1

August 1969

Supported by Office of Naval Research

Grant N00014-67-A-0387-0007

Principal Investigator:

Arthur W. Staats

This document has been approved for public release and sale; its distribution is unlimited. Reproduction in whole or in part is permitted for any purpose of the United States Government.

## ABSTRACT

Recent S-R formulations have indicated that similarity between persons functions as a UCS and that interpersonal attraction is a classically conditioned evaluative response. The thesis of the present study is that similarity is a correlate of evaluative meaning and that the latter rather than the former is responsible for conditioning. The Staats conditioning procedure was used with trigrams as CS and personality-trait adjectives as UCS. The UCS adjectives were previously rated on evaluation and similarity scales, and these variables were held constant across levels of each other in a 2 x 2 within Ss design. In support of the hypothesis, it was found that for 89 pretested Ss evaluation and similarity were highly correlated (.879) and that for the 16 Ss in the conditioning procedure an evaluative response to trigrams was influenced by evaluation ( $p < .005$ ) but not by similarity ( $p > .20$ ).

In an effort to translate the concept of interpersonal attraction into S-R terminology, a number of theorists (Byrne, in press; Lott & Lott, 1960; Staats, 1964) have proposed that attraction be considered one of a class of implicit attitude responses (Doob, 1947). Byrne (in press) and Staats (1958, 1968) have further specified classical conditioning as a model of the process by which these implicit responses are formed. In general, the classical conditioning models suggest that a person originally functions as a relatively "neutral" stimulus which, when paired with pleasant or unpleasant events as UCS, comes to elicit an implicit evaluative response or CR. Once formed, the stimulus components of these implicit CR's are thought to mediate overt behavioral responses employed as dependent measures of attraction, such as approach-avoidance, sociometric and other ratings, and verbal assessments.

To incorporate within an S-R framework findings indicating that similarity between people results in attraction (e.g., Backman & Secord, 1964; Newcomb, 1956, 1961). Clore and Byrne (in press) have proposed a separate category of the conditioning model in which similarity is assumed to function as a UCS. Using a procedure closely analogous to classical conditioning, these researchers demonstrated that photographs of unknown persons, following pairing with attitude statements either like or unlike those of the subject, evoked positive and negative affective responses. While real individuals were not used as stimulus objects, this study

suggests, as do studies using a cognitive-balance model, that attraction occurs between persons holding similar attitudes. It also suggests the possibility that the formation of attraction responses involves a process of classical conditioning in which similarity acts as UCS. In a series of other studies employing an S-R interpretation, Byrne and his associates have also found attraction to be a function of similarity with regard to such variables as economic status (Byrne, Clore, & Worchel, 1966), personality traits (Byrne, Griffitt, & Stefaniak, 1967), and self-concept (Griffitt, 1966).

While the similarity dimension has accurately predicted the formation of an affective response, it seems reasonable to propose that most individuals consider most of the attitude statements and many of the personality trait descriptions which characterize them to be good or pleasant and the ones which do not to be bad or unpleasant. For those verbal stimuli in which this is the case one could as reasonably ascribe the positive UCS value of these stimuli to pleasantness as to similarity. In other words, the predictive value of the similarity dimension may be attributable to a correlation between similarity and a measure such as the evaluative dimension (e.g., pleasant-unpleasant, good-bad) of the semantic differential.

As part of a general learning theory of human behavior, Staats (see Staats, 1966; Staats & Staats, 1963) has suggested that evaluative meaning is the appropriate measure of stimuli used to condition an evaluative (attraction) response

to a person or other discriminable stimulus. That such a dimension is at least a sufficient, if not exclusive, predictor of affective conditioning has been shown in a series of studies (e.g., Staats & Staats, 1957, 1958; Staats, Staats, & Heard, 1959). Based on Staats' view of attitude conditioning, the thesis of the present study is that similarity does not comprise a separate category of reinforcement but derives its apparent UCS value from the fact that it is a correlate of evaluative meaning. The strategy of the study was to examine the power of personality-trait adjectives to condition evaluative meaning to trigrams. It was expected that when evaluation and similarity were held constant across levels of each other, evaluation would be the sole predictor of UCS value.

#### Method

##### Subjects

Using the criteria described below, twenty-four students attending the University of Hawaii were selected to participate in the conditioning procedure, eight of whom were eliminated following a post-experimental assessment of awareness. Of these 16 subjects 13 were enrolled in graduate education courses and consisted primarily of grade school and high school teachers. Twelve of these thirteen were females. The remaining subjects were undergraduate students in introductory psychology courses, two males and one female. All subjects were volunteers, but the undergraduates

received points contributing to the grade in the course from which they were solicited.

#### The pretest booklet

The pretest booklet consisted of 121 adjectives selected from Anderson's (1968) list of 555 personality-trait adjectives. Words were randomly assigned to 11 pages, and the same randomization was used for all subjects. Beneath each word were two seven-point scales, the evaluation and similarity scales. The two scales always appeared in the same order, evaluation followed by similarity, as shown in this example:

#### AGGRESSIVE

pleasant \_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_ unpleasant  
like me \_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_:\_\_\_\_\_ unlike me

General instructions on the cover sheet of the booklet were similar to those used by Osgood (in Osgood, Suci, & Tannenbaum, 1957).

#### Selection of UCS words and subjects

Based on the ratings of words on the two scales, four lists of 12 adjectives per list were constructed for each subject which had the following characteristics: List 1 was comprised of words rated both pleasant and like me, List 2 of words rated unpleasant but like me, List 3 pleasant but unlike me, and List 4 unpleasant and unlike me. In assigning words to the four lists, ratings of 1, 2, or 3 on the



seven-point (1 to 7) scales were considered pleasant or like me and ratings of 5, 6, or 7 were considered unpleasant or unlike me. Occasionally ratings of 4 (neutral) were used on one of the two dimensions to complete the list of 12 adjectives.

Only those subjects whose protocols provided the requisite four lists were selected to participate in the conditioning procedure. Of 103 pretested subjects, 38 fit the criteria just described. As previously mentioned, not all 38 were employed as subjects in the conditioning procedure.

Figure 1 summarizes the description of the lists, illustrates the 2 x 2 within subjects design, and shows the mean ratings of the UCS adjective lists for all subjects on the evaluative and similarity dimensions. It was desired that each of the two rated dimensions be held constant across each of the two levels of the other factor. Reading to the right of the diagonals and down shows the mean values of pleasant and unpleasant words to be quite close across levels of similarity, and reading to the left of the diagonals and across shows the mean values of the like me and unlike me words to be quite close across levels of evaluation.

#### Procedure

Subjects participated in the conditioning phase one at a time between five and ten days after the pretest. Four trigrams (YOF, LAJ, KUH, and XEH) functioned as CS syllables and were presented by means of a slide projector set so that each slide would automatically be shown for five seconds with

Fig. 1. Mean ratings of the UCS adjective lists on the evaluation and similarity dimensions. (Evaluative ratings are to the right and similarity ratings to the left of diagonal.)

|            |           | EVALUATION  |             |
|------------|-----------|-------------|-------------|
|            |           | Pleasant    | Unpleasant  |
|            |           | Like Me     | Unlike Me   |
| SIMILARITY | Like Me   | 2.28 / 1.64 | 2.32 / 6.43 |
|            |           | List 1      | List 2      |
| SIMILARITY | Unlike Me | 5.48 / 1.66 | 5.69 / 6.47 |
|            |           | List 3      | List 4      |

a five second interval between slides. Approximately one second after the onset of each trigram the UCS words were spoken by the experimenter and then repeated aloud by the subject.

All 12 adjectives comprising a particular list were consistently paired with only one of the four trigrams. For example, for a particular subject YOF might be paired with pleasant and like me adjectives, LAJ with pleasant and unlike me adjectives, etc. Each of the 12 adjectives was presented only once for each subject, and each trigram was thus presented 12 times for a total of 48 trigram-adjective pairings. To counterbalance possible differences between trigrams each trigram was paired equally often with each of the four lists of adjectives across the 16 subjects.

The order in which the trigram adjective pairs were presented to the subjects was counterbalanced by using Latin squares. The 48 slides were ordered so that each of the trigrams occurred once in each block of four slides and no trigram occurred more than once in a row.

Instructions to subjects indicated that the study was a learning task in which different modes of presentation, auditory and visual, would be examined. Following presentation of the 48 slides each subject was asked to rate the pleasantness-unpleasantness of the four trigrams under the guise that the way he felt about these syllables might influence learning. The four trigrams and seven-point evaluative scales were presented in random order for each

subject on separate pages. Recall of the words was then tested and the subjects were asked to write on the back of their booklet any thoughts which occurred to them in the course of the experiment which might be relevant, particularly regarding the purpose of the experiment.

Eight of the subjects indicated that pleasant or unpleasant words (or words of a particular feeling) had been associated with particular trigrams. To preserve the counter-balanced design, each time a subject was judged aware additional subjects were run until the blocks were complete. None of the subjects indicated awareness of the similarity dimension, that trigrams had also been paired with words which were like them or unlike them.

### Results

Table 1 presents the mean evaluative ratings of the CS trigrams following conditioning and the analysis of variance. Summing over levels of the two variables produced mean values which are quite close to a "neutral" rating of four for the similarity factor and in the expected directions above and below four for the evaluative factor. In the analysis of variance the  $F$  for evaluation is highly significant ( $p < .005$ ) while that for similarity is not ( $p > .20$ ). The similarity by evaluation interaction is also not significant but a tendency toward interaction is evident ( $p < .10$ ).

The mean ratings of the CS trigrams for subjects judged aware, shown in Table 2, reflect the same relationships as

do the data for unaware subjects with the difference between levels of the evaluative dimension greatly increased. Since counterbalancing of trigrams for aware subjects could not be accomplished no formal statistical analysis was carried out, but occurrence of the same trend toward interaction in both aware and unaware subjects urges caution in rejecting such a factor.

The mean ratings by 89 subjects<sup>3</sup> on the two scales for each of the 121 words was determined and a single correlation between the mean evaluation and similarity ratings of these words was found to be .879.

#### Discussion

Byrne and his associates (Byrne, in press; Clore & Byrne, in press) have suggested that similarity between persons with regard to such variables as attitudes and personality traits functions as a UCS in conditioning attraction. On the basis of the results of the present study, it is suggested that evaluative meaning is a more direct and parsimonious measure than is similarity of the power of stimuli to condition an affective response. As hypothesized, when evaluation and similarity were held constant across levels of each other, evaluation accurately predicted conditioning of attitudes to trigrams, and similarity did not contribute to this prediction. The sizable positive correlation (.879) found between these dimensions may account for the apparent UCS value of similarity in some of the previous

studies of conditioned attraction.

While the experimental situation was, compared with typical attraction studies, highly artificial, the results suggest a clarification of the classical conditioning model which is in some respects quite congruent with cognitive and other theories of attraction. For example, Newcomb, first using a balance model (1953) and later using reinforcement terminology (1956), has also maintained that similarity of attitudes produces attraction; but he has specified that it has this effect only because the likelihood of reward is higher for similar than dissimilar persons. Thibaut and Kelley (1959) have also suggested that it is the reward available in a relationship which results in attraction and that in some cases reward depends on similarity and in others on differences between persons. If, as seems reasonable, the reward to which these theorists refer elicits positive evaluative meaning, the present findings reflect a similar relationship. While a correlation between evaluative and similarity was found, it appeared to be the evaluative rather than the similarity component which conditioned an affective response.

Byrne and his associates (Byrne, Griffitt, & Clore, 1968) have also related evaluative meaning to the similarity-attraction relationship by specifying that similar attitude statements have "evaluative (affective) meaning and hence reinforcement properties (p. 962)." One implication of this statement is that similar and dissimilar attitude statements

always or almost always connote positive and negative evaluative meaning, and it seems reasonable to suggest that this is the case. With regard only to attitudes, it may be that in the process of agreeing or disagreeing with attitude statements subjects are also categorizing them as positively or negatively evaluative. For example, if subjects agree that "Medicine should be socialized" they are probably also indicating that this is a good (positively evaluative) attitude. With regard to personality traits, however, the present study (as well as previous research on self-ideal discrepancy) clearly indicates that subjects frequently dislike the traits which happen to characterize them and like traits which do not. Despite the high overall correlation between the means of the similarity and evaluation measures, there was enough individual variation so that 37% of the original sample (38 of 103 subjects) rated at least 20% (24 of 121) of the adjectives listed as being either like me but unpleasant or unlike me but pleasant. Thus, at least for similarity of personality traits, it seems appropriate to suggest, like Thibaut and Kelley, that reward (and hence attraction) may in some cases depend on similarities and in others on differences between people.

It is important to note that the concept of attraction in the present study was specifically restricted to a definition in terms of an evaluative rating. It seems likely that other measures of attraction, such as frequency of interaction, may be a function of personality similarities

which are independent of evaluative meaning. For example, two persons who possess the same low-valued personality traits might choose each other in a social or work situation, since they might have learned to expect more reward and less censure from similar persons than from more attractive persons. The distinction being drawn here is between attraction considered as an evaluative response, as it is in the present paper, versus attraction as expected reciprocation in friendship. This distinction is similar to the one Newcomb (1956) makes between "admiration at a distance" and frequency of interaction in friendship groups.

The orientation of the present paper is not intended to serve simply as a translation of terms from one paradigm to another but to represent an approach to attraction which emphasizes language and communication between persons. It is suggested that the mere quantity of affective responses to words occurring during inter-personal interaction combines (not necessarily in an additive manner) to produce responses of attraction or dislike. It would be predicted, for example, that with such variables as word arrangement (e.g., see Heise, 1969) and non-verbal cues held constant, the mere contiguous occurrence of positive or negative affective words with a person would account for a large portion of affective responses to the person. The implications of this position are presently being studied by the author and A. Staats in a situation involving an actual individual as CS object.



The correlation between evaluation and similarity found in the present study indicates that many people tend to view the personality traits they possess as good traits. The development of this aspect of human personality could be accounted for by assuming that parents reinforce those responses of the child which are most reinforcing to the parents and that, in general, parents prefer and reinforce the child's pleasant rather than unpleasant self-descriptions. In addition, Staats (1968) would suggest that in the process of instrumentally conditioning verbal descriptions one is also classically conditioning meaning to the words used, and in so doing establishing the capacity of these verbal stimuli to reinforce an instrumental response.

Both Byrne and Staats have found that words or phrases capable of classically conditioning an evaluative response are also able to function as reinforcement and punishment in an instrumental task (Golightly & Byrne, 1964; Staats, 1964; Finley & Staats, 1967). As might be expected from their theoretical orientations, Staats employed words of positive and negative evaluative meaning as reinforcers and aversive stimuli, while Byrne employed similar and dissimilar attitude statements. It may, as discussed above, be difficult to separate the evaluative or similarity components of attitude statements. On the basis of the results of the present study, however, it would be predicted that similarity of personality-trait words would not function as a reinforcer in an instrumental task beyond the extent of their correlation with evaluative meaning.

## References

- Anderson, N. H. Likeableness ratings of 555 personality-trait adjectives. Journal of Personality and Social Psychology, 1968, 9, 272-279.
- Backman, C. W., & Secord, P. F. The compromise process and the affect structure of groups. Human Relations, 1964, 17, 19-22.
- Byrne, D. Attitudes and attraction. In L. Berkowitz (Ed.), Advances in Experimental Social Psychology. Vol. 4, New York: Academic Press, in press.
- Byrne, D., Clore, G. L., Jr., & Werchel, P. The effect of economic similarity-dissimilarity on interpersonal attraction. Journal of Personality and Social Psychology, 1966, 4, 220-224.
- Byrne, D., Griffitt, W., & Clore, G. L., Jr. Attitudinal reinforcement effects as a function of stimulus homogeneity-heterogeneity. Journal of Verbal Learning and Verbal Behavior, 1968, 7, 962-964.
- Byrne, D., Griffitt, W. B., & Stefaniak, D. Attraction and similarity of personality characteristics. Journal of Personality and Social Psychology, 1967, 5, 82-90.
- Clore, G. L., Jr., & Byrne, D. The process of personality interaction. In R. B. Cattell (Ed.), Handbook of modern personality study. Chicago: Aldine, in press.
- Doob, L. W. The behavior of attitudes. Psychological Review, 1947, 54, 135-156.

- Finley, J. R., & Staats, A. W. Evaluative meaning words as reinforcement stimuli. Journal of Verbal Learning and Verbal Behavior, 1967, 6, 193-197.
- Golightly, C. C., & Byrne, D. Attitude statements as positive and negative reinforcements. Science, 1964, 146, 798-799.
- Griffitt, W. B. Interpersonal attraction as a function of self-concept and personality similarity-dissimilarity. Journal of Personality and Social Psychology, 1966, 4, 581-584.
- Heise, D. R. Affectual dynamics in simple sentences. Journal of Personality and Social Psychology, 1969, 3, 204-213.
- Lott, B. E., & Lott, A. J. The formation of positive attitudes toward group members. Journal of Abnormal and Social Psychology, 1966, 61, 297-300.
- Newcomb, T. M. An approach to the study of communicative acts. Psychological Review, 1953, 60, 393-404.
- Newcomb, T. M. The prediction of interpersonal attraction. American Psychologist, 1956, 11, 573-586.
- Newcomb, T. M. The acquaintance process. New York: Holt, Rinehart & Winston, 1961.
- Osgood, C. E., Suci, G. J., & Tannenbaum, P. H. The measurement of meaning. Urbana, Ill.: University of Illinois Press, 1957.
- Staats, A. W. Human learning. New York: Holt, Rinehart & Winston, 1964.
- Staats, A. W. Learning language, and cognition. Holt, Rinehart & Winston, 1968.

- Staats, A. W. & Staats, C. K. Attitudes established by classical conditioning. Journal of Abnormal and Social Psychology, 1958, 57, 37-40.
- Staats, A. W., & Staats, C. K. Complex human behavior. New York: Holt, Rinehart, & Winston, 1963.
- Staats, A. W., Staats, C. K., & Heard, W. G. Language conditioning of meaning to meaning using a semantic generalization paradigm. Journal of Experimental Psychology, 1959, 57, 187-192.
- Staats, C. K., & Staats, A. W. Meaning established by classical conditioning. Journal of Experimental Psychology, 1957, 54, 74-79.
- Thibaut, J. W., & Kelley, H. H. The social psychology of groups. New York: Wiley, 1959.

Table 1

Mean Evaluative Ratings of CS Trigrams  
per Condition: Unaware Ss<sup>a</sup>

| Similarity | Evaluation |            | Total |
|------------|------------|------------|-------|
|            | Pleasant   | Unpleasant |       |
| Like me    | 3.56       | 4.06       | 3.81  |
| Unlike me  | 2.88       | 5.00       | 3.94  |
| Total      | 3.22       | 4.53       | 3.88  |

Analysis of Variance

| Source         | <u>df</u> | <u>MS</u> | <u>F</u> |
|----------------|-----------|-----------|----------|
| Evaluation (A) | 1         | 31.64     | 13.70*   |
| Similarity (B) | 1         | .05       | <1       |
| Subjects (S)   | 15        |           |          |
| A X B          | 1         | 8.23      | 3.43     |
| A X S          | 15        | 2.31      |          |
| B X S          | 15        | 4.54      |          |
| A X B X S      | 15        | 2.40      |          |
| Total          | 63        |           |          |

<sup>a</sup>1 is pleasant end of scale, 7 is unpleasant.

\*p < .005

Table 2

Mean Evaluative Ratings of CS Trigrams  
per Condition: Aware Ss

| Similarity | Evaluation |            | Total |
|------------|------------|------------|-------|
|            | Pleasant   | Unpleasant |       |
| Like me    | 2.00       | 5.38       | 3.69  |
| Unlike me  | 1.38       | 6.38       | 3.94  |
| Total      | 3.22       | 4.53       | 3.88  |

#### Footnotes

<sup>1</sup>This article is based on the author's doctoral dissertation submitted to the Department of Psychology of the University of Hawaii. The author wishes to express his appreciation to A. Staats, committee chairman, for his valuable advice and guidance; to the other members of his committee, with a particular note of thanks to K. Minke and I. Reid; to W. Cash and I. Reid for their help in finding volunteer subjects from education; and to D. Byrne and W. Griffitt for their very helpful comments on the proposed as well as the completed project.

<sup>2</sup>Now at Bradley University.

<sup>3</sup>Fourteen subjects who did not complete the pretest booklet were eliminated from the analysis.

| Security Classification  |   | DOCUMENT CONTROL DATA - R & D                       |  |
|--|---|---|--|
| (Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)   |   |   |  |
| 1. ORIGINATING ACTIVITY (Corporate author)   |   | 2a. REPORT SECURITY CLASSIFICATION                  |  |
| Dr. Arthur W. Staats<br>Department of Psychology, University of Hawaii<br>Honolulu, Hawaii 96822   |   | Unclassified  |  |
| 3. REPORT TITLE  |   | 2b. GROUP   |  |
| Conditioned Attraction, Similarity and Evaluative Meaning  |   |   |  |
| 4. DESCRIPTIVE NOTES (Type of report and inclusive dates)  |   |   |  |
| 5. AUTHOR(S) (First name, middle initial, last name)   |   |   |  |
| Richard B. Stalling  |   |   |  |
| 6. REPORT DATE   | 7a. TOTAL NO. OF PAGES  | 7b. NO. OF REFS                                     |  |
| August 1969  | 20  | 23  |  |
| 8a. CONTRACT OR GRANT NO.  | 9a. ORIGINATOR'S REPORT NUMBER(S)   |   |  |
| ONR N00014-67-A-0387-0007  | Technical Report Number 1   |   |  |
| 8b. PROJECT NO.  | 9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report) |   |  |
|  |   |   |  |
| 10. DISTRIBUTION STATEMENT   |   |   |  |
| Distribution of this document is unlimited.  |   |   |  |
| 11. SUPPLEMENTARY NOTES  |   | 12. SPONSORING MILITARY ACTIVITY                    |  |
|  |   | Office of Naval Research<br>Washington, D. C. 20360 |  |
| 13. ABSTRACT   |   |   |  |
| <p>Recent S-R formulations have indicated that similarity between persons functions as a UCS and that interpersonal attraction is a classically conditioned evaluative response. The thesis of the present study is that similarity is a correlate of evaluative meaning and that the latter rather than the former is responsible for conditioning. The Staats conditioning procedure was used with trigrams as CS and personality-trait adjectives as UCS. The UCS adjectives were previously rated on evaluation and similarity scales, and these variables were held constant across levels of each other in a 2 x 2 within Ss design. In support of the hypothesis, it was found that for 89 pretested Ss evaluation and similarity was highly correlated (.879) and that for the 16 Ss in the conditioning procedure an evaluative response to trigrams was influenced by evaluation (<math>p &lt; .005</math>) but not by similarity (<math>p &gt; .20</math>).</p> |   |   |  |



14

KEY WORDS

LINK A

LINK B

LINK C

ROLE

WT

ROLE

WT

ROLE

WT

attitudes  
classical conditioning  
evaluative meaning  
human learning and conditioning  
interpersonal attraction  
social interaction  
social learning